WHAT IS CLAIMED

1. For use with a buck mode DC-DC voltage converter having first and second electronic power switching devices coupled between respective power supply terminals, and a common node thereof coupled through an inductor to a regulated voltage output voltage terminal, a method of deriving a measure of current through and associated temperature of operation of said switching devices comprising the steps of:

(a) measuring said first and second electronic parameters of one of said first and second electronic power switching devices; and

(b) processing values of said first and second electronic parameters as measured in step (a) in accordance with a transform function that is effective to produce values for said current and temperature based upon said measured first and second electronic parameters of one of said first and second electronic power switching devices.

2. The method according to claim 1, wherein step (b) includes storing a map of current and temperature values in terms of said first and second electronic parameters of said one of said first and second electronic power switching devices, and coupling values of said first and second electronic parameters measured in step (a) to said map and extracting therefrom values of said current and temperature for said one of said first and second electronic power switching devices.

3. The method according to claim 2, wherein said first and second electronic power switching devices comprise power MOSFETs, and said first and second electronic parameters correspond to reverse conduction voltage (V_{ON}) and body diode conduction voltage (V_{DF}) of said one of said first and second power MOSFETs.

4. The method according to claim 3, wherein step (a) comprises measuring said conduction voltage (V_{ON}) during a synchronous conduction cycle and measuring said body diode conduction voltage (V_{DF}) during an asynchronous conduction cycle for said one of said first and second power MOSFETs.

5. The method according to claim 3, wherein step (b) comprises interpolating values of current and temperature for said one of said first and second electronic power MOSFETs from values of current and temperature contained in said map.

6. The method according to claim 1, wherein said first and second electronic power switching devices comprise respective high side and low side power MOSFETs of said DC-DC voltage converter, and said first and second electronic parameters correspond to reverse conduction voltage (V_{ON}) and body diode conduction voltage (V_{DF}) of said low side power MOSFET.

7. A method of deriving a measure of current and temperature values in a buck mode DC-DC voltage converter having high side and low side power switching MOSFETs coupled between respective power supply terminals, and a common node thereof coupled through an inductor to a regulated voltage output, said method comprising the steps of:

(a) performing a synchronous conduction cycle measurement of the value of reverse conduction voltage (V_{ON}), and an asynchronous conduction cycle measurement of the value of body diode conduction voltage (V_{DF}) of said low side power MOSFET; and

(b) subjecting said values of reverse conduction voltage (V_{ON}), and body diode conduction voltage (V_{DF}) of said low side power MOSFET as measured in step (a) to a two-dimensional transform function that is effective to produce values for current and temperature.

8. The method according to claim 7, wherein step (b) includes storing a two-dimensional mapping function of current vs. temperature values in terms of reverse conduction voltage (V_{ON}) and body diode conduction voltage (V_{DF}) of said low side power MOSFET temperature, and coupling said value of reverse conduction voltage (V_{ON}), and said value of body diode conduction voltage (V_{DF}) of said low side power MOSFET to said two-dimensional mapping function and deriving therefrom values of said current and temperature for said low side power MOSFET.

9. The method according to claim 8, wherein step (b) comprises interpolating values of current and temperature for said low side power MOSFET from values of current and temperature contained in said two-dimensional mapping function.

10. For use with a buck mode DC-DC voltage converter having first and second electronic power switching devices coupled between respective power supply terminals, and a common node thereof coupled through an inductor to a regulated voltage output voltage terminal, an arrangement for deriving a measure of current through and associated temperature of operation of said switching devices comprising the steps of:

parameter measurement circuitry which is operative to measure said first and second electronic parameters of one of said first and second electronic power switching devices; and

a processing unit which is operative to process values of said first and second electronic parameters as measured by said parameter measurement circuitry in accordance with a transform function that is effective to produce values for said current and temperature based upon said measured first and second electronic parameters of one of said first and second electronic power switching devices.

11. The arrangement according to claim 10, wherein said processing unit contains a two-dimensional mapping function of current and temperature values in terms of said first and second electronic parameters of said one of said first and second electronic power switching devices, and is operative to transform measured values of said first and second electronic parameters into values of said current and temperature for said one of said first and second electronic power switching devices in accordance with said two-dimensional mapping function.

12. The arrangement according to claim 11, wherein said first and second electronic power switching devices comprise power MOSFETs, and said first and second electronic parameters correspond to reverse conduction voltage (V_{ON}) and body diode conduction voltage (V_{DF}) of said one of said first and second power MOSFETs.

13. The arrangement according to claim 12, wherein said parameter measurement circuitry is operative to measure said conduction voltage (V_{ON}) during a synchronous conduction cycle and to measure said body diode conduction voltage (V_{DF}) during an asynchronous conduction cycle for said one of said first and second power MOSFETs.

14. The arrangement according to claim 13, wherein said processing unit is operative to interpolate values

of current and temperature for said one of said first and second electronic power MOSFETs from values of current and temperature contained in said map.

15. The arrangement according to claim 10, wherein said first and second electronic power switching devices comprise respective high side and low side power MOSFETs of said DC-DC voltage converter, and said first and second electronic parameters correspond to reverse conduction voltage (V_{ON}) and body diode conduction voltage (V_{DF}) of said low side power MOSFET.